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THE MANAGEMENT OF NATURAL RESOURCES IN THE RURAL AREA

ABSTRACT

The whole economic, social and spiritual life depends on the natural resources, put into value under different forms, depending on the human intelligence and knowledge. The international community is increasingly getting aware of the importance of the natural capital in the creation of a competitive economy, in ensuring the national security and the social justice. In recent years, the economic growth doubled the ecologic impact upon the planet, while the pressure upon the environment grew fast, which led to the emergence of a deficit of natural resources both for the present and the next generations. In this context, the development issue is redefined at global level.

The aim of the paper is to identify the necessary measures for the improvement of the management of natural resources having in view the rural area development, as defined and applied through the international framework of action, with obligatory character, under the form of treaties or conventions, or with non-obligatory character, under the form of declarations, resolutions or sets of guidelines and political orientations, institutional measures and viable funding mechanisms.

This framework at international level, which was created in time and under a dynamic evolution, considers the rural human settlements as a distinct form of territory anthropization, found in a series of sustainable relations with the physical-geographic components of nature strengthened by traditions, customs and interests, expressed in the landscape by different types of rural communities.

Key words: sustainable development, resources, environment protection, rural area.

JEL Classification: Q01, Q20, Q56.

1. INTRODUCTION

The rural area is the expression of the man's long-lasting effort to use the physical and geographical components of nature for his own service. The economic function of the rural area is considered as the basic, primary function, having as main pillar – agriculture. In agriculture, the land, the water, the climate, the atmosphere and its components, the forests, the plants, the animals are important resources. The relation between agriculture and the natural environment represents the basis of the sustainable development of the rural area and has a major impact upon the future of the global economy.

The expansion of the urban area, the development of the communication ways, the implementation of certain non-agricultural activities, the uncontrolled use

of chemical substances, the agricultural and forest land operation in the absence of anti-erosion protection etc. determined the emergence and intensification of some of the most serious scourges of the modern world: the intense pollution of the countryside, the deterioration of the agricultural and forest landscape, the alarming diminution of the flora and fauna diversity and the ecological disequilibria in very many eco-systems of the rural area.

Under these conditions, the rural area is no longer and cannot be anymore perceived as a primarily agricultural zone, while the rational use of the natural resources is one of the most important objectives as regards the approach to sustainable development.

2. THE STATE OF KNOWLEDGE

One of the great problems of mankind is environment degradation, a process which affects the majority of natural resources, non-renewable (minerals and fossil fuels), renewable (water, air, soil, wild flora and fauna) and permanent (solar energy, wind energy, geo-thermal, and the wave energy). We experience a development crisis with a natural-human character, which gets worse the balance of compatibility between the natural environment and that created by man, with consequences which become irreversible in time and space, implying an increasingly large number of people being able to endanger life evolution at world level where "Poverty is an enemy of the environment as big as the richness"¹.

The artificial pollution of the environment emerged together with the humanity, but it developed and diversified along the evolution of the human society, being nowadays one of the most important concerns of the specialists in different fields of science, of the governments, of the whole population on the Earth. The fight against pollution started in the 7th decade of the previous century, when the first comprehensive laws were developed in order to prevent the future contaminations of the environment.

In this context, the protection and preservation of the natural resources of the environment presents a multitude of regional and national aspects, depending on the stage of economic and social development, as the environment can be positively and/or negatively affected both by the excessive development and by the underdevelopment. In order to give hope to the Earth, the concerns regarding the sustainable management of the resources represent a priority for all the fields of human activity, redefined at global level through an international frame of action. This comprises many legal measures, with mandatory character under the form of treaties or conventions, as well a series of measures with non-mandatory character, under the form of declarations, resolutions or sets of guidelines and policy orientations, institutional measures and viable financing mechanisms.

¹ V. Tufescu, M Tufescu, *Ecologia și activitatea umană*, Ed. Albatros, București, 1981.

3. MATERIAL AND METHOD

In the rural area, agriculture, pisciculture and forestry are the main occupations for the greatest part of its inhabitants. These occupations are determining factors of the quality of the rural areas and of the natural environment. It has already been demonstrated that there is a positive correlation between the preservation of the natural environment, the preservation of the agricultural ecosystems and the development of the business environment. After the ecologic crises emerged (the crisis of the hormones, dioxine, nitrofen, micotoxines and others), the European Union included new sustainable development management systems of the agricultural and rural zones in its agrarian policies.

Starting with the year 1995, the new European dimension imposed to Romania to adopt a series of strategic and sectoral norms and documents with the goal to apply the sustainable development principles. These strategies are based upon the conclusions and recommendations of the European strategies for sustainable development (Lisbon and Göteborg), as well as of the 6th Program of Action for the Environment. The objectives followed are environment preservation, protection and improvement, human health protection and the sustainable use of the natural resources.

Starting from these premises, the paper intends to make an analysis of the contents and elements defining the features of the natural resources management in the Romanian rural area as they result from the National Rural Development Program (NRDP). The information support of the study is completed by scientific reference studies from the specialty national and international literature, normative acts, surveys and reports. The methodological instruments are those specific for the economic research, the analysis and synthesis of information on the concept definition of the specialty terms and the international and national frame of action to ensure the preservation, protection and improvement of the natural resources management.

4. RESULTS AND DISCUSSIONS

4.1. Environment conditions in the Romanian rural area

Due to the interference between the ecosystems Carpathians-Danube and Danube-Black Sea, Romania has a diversified and balanced natural environment, in which large rural areas are integrated, covering over 87% of the country's area and concentrating almost 45% of the total population². The rural settlements are represented by very small villages with only dozens of houses, villages as a main

² According to the NIS indicators used in the analysis from the National Strategic Plan, which is based on these indicators; in the future, the possibility to apply the OECD methodology will be envisaged.

form of human settlement (12,955 in 2007) and communes (2,856 in 2007). The ruralization level ranges from 20% to 70% (Hunedoara with 23.04% rural population in 2007 and Dâmbovița with 69.96% rural population in 2007). The main activities developed in the rural space are the following: agriculture, pisciculture, and forestry, which, in time, have become a pollution source for the environment and mainly for the waters.

The natural environment of the rural area is generally characterized by a good preservation condition of the natural soil and water resources, by a variety of traditional landscapes and by a high bio-diversity level, associated with a diversity of habitats and ecosystems, forests and valuable agricultural landscapes.³ The unique natural inheritance is given by:

- The relief made of three major units, in balanced proportion (31% mountains, 36% hills and plateaux and 33% plains and valleys);
- The temperate-continental transition climate with ocean influences from the West, Mediterranean from South-East and excessively-continental from the East; the relatively dense hydrographic network, the balanced distribution in the territory, with running waters radially distributed;
- The diversified vegetation, conditioned by the relief and by pedoclimatic elements;
- Terrestrial and aquatic fauna grouped by areas differentiated by the biotope of each species;
- Useful mineral resources, with old mining exploitation tradition.

In general, the natural resources of the Romanian rural area are well preserved. The agricultural land with high natural value cover an important area, but both the abandonment of agricultural resources and the inadequate farming practices appeared as a result of the lack of specialty knowledge or of the limited financial resources, which influenced biodiversity in a negative way and determined the emergence or the aggravation of soil erosion phenomena. In spite of the general tendency of extensive agricultural practice and of reduced use of chemical substances in agriculture, a series of agricultural land areas were affected by the incorrect way of using the chemicals and pesticides, irrigations, drainings, or by the application of some inadequate mechanical works; out of this reason, mainly the soil and water were significantly degraded on small areas. The decrease of the livestock number led to the abandonment of the grazing practice, resulting in the degradation of many pastures due to the emergence of certain invasive species. At the same time, the sustained economic increase in the last years started to endanger many species of plants and animals by agriculture becoming more intensive, leading to the natural resources degradation and to the change of the rural landscape.

³ National Rural Development Plan 2007–2013, version IV, December 2009.

4.2. Natural resources in agriculture and forestry

The economic and social development of the human society needs renewable raw materials – soil, water, air, flora and fauna; for agriculture, these resources are true vital riches.

The soil. Romania has good quality soils – mainly in the plain regions, but phenomena such as soil erosion, drought, the negative balance of water in soil or gleyzation, salinization, acidification or alkalization or compaction very much affect soil fertility.

In Romania, the land area has the following distribution by the main relief units: 28.2% mountain zone (including the depressions) ;

- 28.7% Sub-Carpathian hills (including depressions);
- 13.4% low plateaux (Plateau of Bârlad, Dobrogei, Transilvaniei and Moldovei);
- 25.6% plains (Câmpia Română and Banato-Crișana);
- 4,1% Danube Delta and its river meadow.

Taking into account the relief forms, the climate and the hydrographic network we can consider that in Romania, in general, the land resource distribution by the main uses is balanced. The main modalities of land use in Romania are presented in Table 1.

Table 1

Land use categories in 2007

Indicators	Thousand ha	% of total
Total land area	23,839.1	100
Agricultural area, out of which	14,709.3	61.7
– arable	9,423.3	39.5
– pastures	3,330.0	14.0
– hayfields	1,531.4	6.4
– vineyards and vine nurseries	218.0	0.9
– orchards and fruit-tree nurseries	206.6	0.9
Forests and other lands with vegetation, out of which	6,740.9	28.3
– forests	6,314.9	26.5
Constructions, roads and railways	1,075.8	4.5
Waters and ponds	849.9	3.6
Other areas	463.2	1.9
Agricultural area effectively irrigated	320.2	1.3

Source: Romania's Statistical Yearbook, 2008, p. 589.

By the way of use, the agricultural land has the largest share, and within it, the arable land. In Romania, the agricultural area represents around 62% of total land area, while the arable area represents 39.5% of total land area and 64% of the agricultural area. The share of arable land in total agricultural area is higher than in EU-15, 64% respectively, as opposed to 55%. The arable land area per capita is also high, i.e. 0.42 ha in Romania as against 0.20 ha in EU-15.

The agricultural area of Romania (61.8% of the total area of the country in the year 2005) slightly decreased each year. The transfer of land areas to the forestry sector and that of constructions was the main reason for the reduction of the agricultural area in the last 20 years. The reduction of the land areas, by including them in the urban zone, represents a phenomenon met in the zones with higher productivity, while the change of use category of the agricultural land into the forestry one emerges, mainly, in the defafourized zones.

The soils quality is a relevant indicator in the operation of resources appreciation. In order to assess the natural potential of the agricultural lands in view of their rational use, the soils were divided into classes, types and subtypes, in function of different criteria as are: troficity, the microorganism quantity, the ecologic supply, the bioproductive capacity and the protection capacity, fertility or productivity. In this way, according to the productivity criterion, soils were divided into 5 classes of suitability.

From this point of view, the agricultural land can be classified into 5 quality classes (Table 2), differentiated according to the Land Quality Index average (classes I – 81–100 points up to classes V – 1–20 points). It is to be noticed the fact that in the case of arable land, that cover 63.34% of the mapped area, most land areas are grouped into the II and III quality classes. Practically, the arable first class land includes only 8.77% of the total agricultural land, the remaining classes presenting various restrictions. Most of pastures and grasslands are included in III–V classes, most of the vineyards are included in II–IV classes, while the orchards in III–V classes. Most of agricultural land areas having a high level of the Land Quality Index are in the Romanian Plain (in a relatively compact area that has as central place Bucharest) and in Western Plain.

Table 2

Distribution of agricultural land by soil suitability classes, 31 Dec. 2001

Suitability classes	Way of use %			
	Agricultural land	Arable	Pastures and hayfields	Vineyards and orchards
Total area, out of which into suitability classes :	100.0	100.0	100.0	100.0
I	2.8	3.8	1.1	0.2
II	24.6	35.7	4.5	16.0
III	20.7	25.1	12.1	23.5
IV	24.4	18.4	35.8	24.7
V	27.3	17.0	46.5	35.6

Source: Romanian Academy, Economic Development of Romania, Publishing House of Romanian Academy, Bucharest 2003, p. 153.

In general, in the distribution of crops by soils and regions of the country, they take into account the soil suitability class, including the climate conditions, the humidity degree and the crop rotation need, as well as the demand on the market

for the agricultural products. With all this, from the data above it is observed that the share of the industrial crops and vegetables is smaller versus the natural potential and the value of these products on the domestic and foreign markets.

The factors which determine the diminution or even the destruction of some functions of the soil, and by this, its productive capacity, are: the drought, the humidity excess, soil erosion by water, wind erosion, the saltiness in soil, soil compactness, the crust formation, the lowering of the humus reserve, the increase of acidity or of alkalinity, the decrease of fertilizers composition (N,P,K, microelements), the destruction by excavations, chemical pollution, waste cover).

The water erosion is one of the biggest problem of Romanian soils and is present in different degrees on the 6.3 millions ha, out of which about 2.3 millions benefit from anti-erosion works, most of them having for the time being a high level of degradation; this together with the landslides (about 0.7 millions ha) causes up to 41.5 t/ha/annually soil losses. The wind erosion is present on about 0.4 millions ha, and this area is expected to increase, taking into account the fact that in the last years, some forests and shelter belts from areas with sandy soils were deforested, susceptible to this degradation process.

The periodical soil humidity excess affects about 3.8 millions ha, out of which most are areas with drought-drainage works. Some of the perimeters from areas with old or inefficient or not maintained damming works are periodically flooded, thus being important losses registered through the destruction of households, agricultural cultures, livestock, communication systems and human losses.

The excessive content of stones in the upper side of the soils affects about 0.3 millions ha. The soils salinization is present on about 0.6 millions ha, having tendencies to deteriorate in irrigated or drained and irrationally exploited areas or in other areas having a secondary salinization potential that totalize other 0.6 millions ha. The deterioration of the structure and the compaction of soil ("plough base") manifests on about 6.5 millions ha; the primary compaction is present on about 2 millions ha arable lands, and the tendency of forming the crust at the soil surface on about 2.3 millions ha.

The water. Romania's sweet water resources are low in comparison with the European average and do not have an uniform territorial and temporary repartition. Their quality is less affected for the time being by the consume of fertilisers in agriculture and more by the poor infrastructure of the sewage and water clearance in rural area.

The largest resource of fresh water comes from the Danube and other rivers, but the Romanian hydrological resources are not spread uniformly across the entire territory. Except the Danube's water supply, Romania's water resources accounts for an average of only 2,660 m³ water/inhabitant/year, compared to the European average of 4,000 m³ water/inhabitant/year, Romania therefore belongs to the category of countries with limited water resources.

According to a special study a significant reduction in ground and surface water pollution caused by agriculture and is a reflection of a decline of the excessive fertilizer use. The worst quality of groundwater is in the rural areas, where the sewerage network is underdeveloped or missing and the waste water directly reaches the underground (through permeable latrines or street dikes) or indirectly (from stable manure dumps, garbage dumps).

Romania has implemented from a legal point of view the (EC) Directive 2000/60 (Water Framework Directive) – the national Water Law (107/1996 being amended with the general objective of reaching “good status” for all waters by 2015), through Law no. 310/2004. The management plans for the basin/hydrographical area shall consist in:

- a general presentation of the basin/hydrographical area,
- a characterisation of the surface waters,
- a characterisation of the underground waters,
- the identification and mapping of the protected areas,
- the economical analyses,
- the integrated monitoring of the waters,
- the environmental objectives,
- the measures programmes,
- special measures’ programmes for underbasins, water categories and types,
- the informing, consultation and public’s participation.

Concerning the implementation of the (EC) Directive 91/676/EEC (Nitrates Directive) at the end of the year 2004, an inventory was carried out at administrative territorial unities level (NUTS 5) in order to identify the nitrates vulnerable zones (the map of communes assigned as nitrates vulnerable zones resulted out of activities specific to agriculture-Annex 2.21 from the National Strategic Plan). On the basis of this inventory, 251 communes were identified with a total surface of about 1.6 million ha, that represent 6.7% from Romania’s surface, out of which agricultural land about 1.1 million ha, representing 7.6% out of the total agricultural land, arable land about 0.7 million ha, representing 7.8 from the total arable land, grasslands about 0.3 million ha, representing 6.7% of grasslands. The assigned categories of nitrates vulnerable zones are:

- a) potential vulnerable zones, as a result of nitrates driving towards surface waters through flowing on slopes;
- b) potential vulnerable zones through nitrates leaching under the soil towards water bearing beds;
- c) zones with high degree of nitrates vulnerability through nitrates leaching under the soil towards water bearing beds.

In order to ensure the monitoring of the pollution from agricultural sources and activities was organised the *Integrated National Support Monitoring for Supervising, Control and Decisions in order to reduce the polluters’ from agricultural sources contribution in surface waters and underground waters*, that

belongs to the National System of Waters Integrated Monitoring. This monitoring system envisages the supervision of nitrates concentration in sweet waters, as well as the periodical checking of the sweet and costal waters' eutrophisation. It can be estimated the for the time being, many farms from the nitrates vulnerable zones do not have adequate abilities for depositing the farmyard manure, not yet totally fulfilling the requirements for water protection.

Several areas of the country are affected by excess moisture and floods risk. These areas are important for the management of biodiversity conservation and are present in various regions of the country.

Flooding occurs frequently in Romania, especially in spring, due to snow melting and blockage of rivers by ice and in summer due to heavy torrential rains, when the rivers exceed the average levels. Over the last 16 years the flood occurrence has increased as a consequence of the climate change combined with illegal deforestation and the lack of maintenance of flood prevention infrastructure. The frequency and scale appears to be on the increase shape.

Droughts is presented on about 7.1 millions ha, surface on which previously was most of the 3.2 million ha agricultural land having irrigation systems.

The agri-biodiversity. Natural and semi-natural ecosystems cover some 47% of Romania's national territory. A total of 783 types of habitats have been identified and characterized (13 coast habitats, 143 habitats specific for wet areas, 196 habitats specific for pasture and hayfields, 206 forest habitats, 90 habitats specific for dunes and rocky areas and 135 habitats specific for agricultural land) in 261 areas analyzed in the entire country.

This habitats are characterised by a certain composition of flora and fauna, components of the bio-coenosis and are influenced by various clime and soil factors. The clime influences of the drought areas in the Eastern part, up to the oceanic influences in the Western areas, as well as the clime differences between the lowland and mountains due to the relief altitude have determined the appearance of an important number of habitats. The chemical composition of sub layer rocks (soil and under-soil) is another factor that determines the important variety of habitats in Romania.

Romania is one of few European countries where traditional agri-systems represent significant pools which preserve the genetic diversity of crop plants and animals at the place of formation and development (i.e. *in situ*). However, in the present conditions many plants and animals are endangered and the landscape modifications are the first sign of environmental deterioration.

Regarding the flora, 3,700 species of plants were identified in Romania, out of which 23 are declared under protection, 74 are extinct, 39 are endangered, 171 are sensitive and 1,253 are rare. In regard to fauna, 33,792 species of animals have been identified, of which 33,085 non-vertebrate and 707 vertebrate species.

The protection regimes was imposed at national level, according the prevision of Emergency Government Ordinance no. 57/2007 regarding the regimes of natural protected areas, preservation of natural habitats of wild flora and fauna.

The forests and other lands with forest vegetation are covering an important area (over 28% of the land fund of Romania), but is under the European average of 37%. The greatest part of the forests is to be found in the mountain zone (51%), while 37% of the area with forests is on hills and only 10.9% is at plain. According to the study made by the Institute of Silvicultural Researches and Settlements, for the Romanian geographical space the optimum value of the areas covered with forests is of approximately 35% in order to ensure a sustainable management of the land area on medium term.

Besides their economic value, the forests in Romania have an important potential from point of view of the multifunctional use of the lands, representing both a source for social nature goods, and also advantages regarding the environmental protection. Over half (52%) of the Romanian forests are classified as having special functions of protection (soil protection, water protection, climate protection, savage fauna preservation) and leisure functions, while the rest have only production and protection functions. Other important functions of the forests in Romania are comprising: the leisure time and hunting, the protection against floods (through the regularization of the water courses), the biodiversity preservation (mainly of the savage fauna habitat), the attenuation of the climate changes (by sequestration of Carbon in the soil) and the supply of non-woody forest products (forest fruits, seeds, mushrooms etc). As regards the relationship between the biodiversity management and forests, Romania is among the few European countries which still has virgin forests – around 300,000 ha, present greatly in the mountain zone.

4.3. The impact of the climate changes upon agriculture and silviculture

Both agriculture and the Romanian forestry fund can play an important role in fight with the climate changes, strongly felt during the last years, especially through floods and high temperatures and prolonged droughts. These phenomena are affecting both agricultural and forestry productivity and valuable habitats and ecosystems.

The observed and anticipated effects of climate change on Romania's agriculture and forestry are as follows:

- during the last decade, the incidence of both droughts and floods has become more frequent with a negative impact on agricultural yields (especially for wheat and corn) and an affect upon flora and fauna species. In some cases, human activities such as the deforestation of mountain areas have further increased the incidence and intensity flooding by accelerating the flow of torrential water to streams and rivers;

- more than a quarter of the Romanian territory is covered by forested land which comprise a large number of species and ecosystems. The impact of climatic

changes on the Romania's forests has been analyzed with the support of several global climate models. For the forests situated in plain or hill regions a considerable decrease of forest productivity is forecasted after 2040 because of the temperature increase and the decrease in the volume of precipitation.

As forms of adapting to this climate changes, the agriculture has to take into account varieties of plants that resists to new climate parameters, parameters at which the calendar of agricultural activities has to be well correlated. Furthermore, the agricultural activities can be better protected through the concentration of the afforestation activities in lowlands (more exposed to the phenomena associated with climate changes), through rehabilitation of dikes and through the irrigation systems rehabilitation.

Agriculture can also impact negatively upon air quality through the emission of various nitrogen compounds including nitrous oxides and ammonia. These generate important changes in the concentration of greenhouse gases, resulting mainly from the decomposition of chemical fertilizers and the combustion of biomass. The most significant emissions of ammonia come from intensive livestock farming and from the inappropriate use of organic fertilisers. Agriculture accounts for approximately 80% of ammonia emissions in Romania. When excess ammonia is re-deposited to the soil, it has a soil acidifying effect that can damage flora and fauna.

In accordance with the Gothenburg Protocol a total ammonia ceiling will be set for Romania from 2010. It is not anticipated that this will be a problem as the present total annual emissions are relatively low due to the reduced number of livestock and disappearance of large intensive livestock production units during the last 10-15 years.

Romania signed the Kyoto Protocol⁴, by which it assumed itself the engagement to support the fight against climatic changes through the reduction of the gas transmissions with hothouse effect. This protocol acknowledges the role of agriculture in Carbon stocking through: the change of lands use and their management without changing their use.

The change of the land use is referring to deforestations and afforestations. The balance of passing the forest lands into agricultural lands and viceversa, is compared for the period 2008–2012 to the reference year 1990. The protocol establishes that one hectar of cut wood is degaging more Carbon than it encompasses one hectar of “young” wood, planted right now. To each country signing the agreement was fixed a Carbon quota which cannot be exceeded without suffering penalties.

⁴ The Kyoto Protocol was created in 1997, as a first phase in fight against the climate changes, but was officially vigoured on February 16, 2005. Out of the industrialized countries only four did not engage themselves in reducing the polluting transmissions: United States, Australia, Monaco and Lichtenstein.

Managing the lands without changing their use means four options, at choice, which must be applied by the signing countries:

- the option of forests management, which implies the making of a balance of the forests planted in 1990 and which will still exist in 2008–2001. This option was thresholded for each country through international agreements. The quotas applied to different countries were criticised, being considered too high for certain countries and too small for others (Canada, Russia, Japan);

- the option of restoring the vegetal mass, which can be reached through planting hedges;

- the option of managing the agricultural lands, which makes reference especially to the plant cultivation without treatments;

- the option of pastures management.

- the case in which certain countries are deciding to appeal to this measure by which agriculture is participating to the reduction of hothouse gas transmissions, the international authorities could decide the granting of some higher quotas of transmissions.

The main sources of air pollution and greenhouse gas emissions in Romania are the energy production, transportation, and to a lesser extent, agriculture. The low level of mechanization in Romanian agriculture, in contrast with European average, together with small areas covered by greenhouses, are also significant aspects is respect to minimising the sector contribution to climate change. However, the old stock of tractors and other agricultural machinery require renewal in order to maintain a low level of emissions.

The agriculture and forestry can make an important contribution to the further climate changes mitigation through the use of afforestation for the absorption and retention of greenhouse gases and the use of biomass as a renewable energy source.

4.4. The strategy of financing the resource management in the rural area

In the context of Romania's accession to the European Union, the national development policy was connected to the policies, objectives, principles and regulations of the community in the field of protecting and improving of the environment's quality. At the same time, the next future brings forth serious challenges, as well as the maintaining of the natural values and also the fight against the climate changes and justifies the need for a sustainable development, so that the abundant natural resources our country has could be used efficiently and effectively for the benefit of the next generations.

The Community's Strategic Guidelines (CSG) are based on a series of priority policies, laid down by the Göteborg and Lisbon agreements, and especially on the principle according to which a strong economic performance must go hand in hand with the sustainable usage of natural resources. These priorities of the Community

formed the base of selecting the priorities for the Romanian National Rural Development Programme.

The CSG identify the potential of the Member-States' agricultural, food and forestry sectors, of obtaining products with high quality and value, in order to meet the various and increasing needs of European consumers and those of worldwide markets. Developing the Romanian food, agricultural and forestry sectors' abilities in order to achieve a competitive capitalization level in this new commercial environment constitutes an enormous challenge requiring important restructuring and modernization efforts. Nonetheless, the accent on competitiveness must be viewed in the more extended context of sustainable rural development, and this fact means taking into consideration the environment as well as social aspects.

In conformity with the EC Regulation no. 1290/2005 regarding the financing of the Common Agricultural Policy there were created two European funds for agriculture: FEAGA (The European Fund for Agricultural Guarantee) for the financing of the marketing measures and FEADR (The European Fund for Agriculture and Rural Development), for financing the rural development programs.

Agriculture and forestry represent decisive factors for the quality of the rural areas and natural environment. The efforts to increase competitiveness must therefore take into account the need to: a) reduce the negative effects on the environment and b) increase the benefits on environment.

CSG highlight the importance of using Axis 2's measures in order to achieve several environment objectives, including those specific to the Natura 2000 protected areas' network and Water Framework Directive. The CSG require that the financial resources intended for the environment to consider the environment objectives and to contribute to the approach of three European priorities: biodiversity, water and climate changes.

The NRDP responds to these requirements, but, considering Romania's incipient experience in promoting environmentally friendly agricultural practices – including for the domain of surface payments for environment services by farmers and foresters – the intervention of Axis 2 is limited to the financial allocations a little over the minimum foreseen by Regulation (EC) no. 1698/2005.

As well, the quality of the environment from the Romanian rural area is not affected as much as in the EU states with a higher industrialization degree. However, this minimum allocation for Axis 2 is compensated by a considerable "green" side with the other axis – especially for Axis 1, its purpose being that to: a) avoid any possible negative effects on the environment, which may appear due to possible contradictions between the measures, and b) encourage where possible, an proper mixture of the measures in order to maximize the synergic effects in order to obtain benefits for the environment (this approach is consistent with CSG, referring to the implementation of the priorities into actual programmes).

At reaching the priority objectives foreseen through Axe 2 – biodiversity, water and climate changes, NRDP participates with more measures. Taking into

account that between the less favoured areas, the agricultural areas identified areas with extensive management/HNV agricultural lands and those designated as Natura 2000 sites there is a high degree of overlapping, it is foreseen that the combination of payments for less favoured areas with the agri – environment payments and Natura 2000 shall significantly contribute to supporting the viability of farms from these areas and preserving the HNV agricultural systems, including numerous types of habitats and various associated species.

The agri-environment measure has special importance *for biodiversity and preservation of the HNV agricultural and forestry systems*, particularly support the HNV meadows, meadows important for birds and maintaining traditional management practices of meadows. An additional support for the HNV agricultural systems can be provided under Axis 1 – especially by vocational training, consultancy services, support for the semi – subsistence farms, farm modernization and increasing the added value of agricultural products. Although for the time being there is no reference definition of HNV forestry surfaces, this concept can be found within CSG no. 2 and the measure that shall contribute the most to this aspect are Natura 2000 payments for forestry lands. This measure shall directly contribute to the preservation of natural habitats and priority species present on the forestry surfaces within the areas designated as Natura 2000 sites.

The most important measures for *protecting the water and soil resources* endorse agri environment (especially through the support for green cultures) and first afforestation of the agricultural and non agricultural lands. These measures are complementary, meaning that the support offered for setting up green cultures shall be accessible to farmers who own arable lands and shall contribute on big scale to the reduction of nutrient loss, soil erosion and the afforestation has the ability to solve the severe issues of soil erosion, including on strongly degraded surfaces. The agri-environment measure contributes (through its requirements) also to the reduction of fertilisers in agriculture, thus participating at the protection of water resources. An additional support for the preservation of water and soil resources shall be provided under Axis 1 (vocational training, consultancy services, modernization of the holdings, increasing the added value of agricultural and forestry products) and under Axis 3 (investments in the rural infrastructure e.g.: water supply and sewerage systems).

Climate changes are approached by NRDP through the afforestation measures. Still, as it is an important priority, other measures within Axes 1, 2 and 3 shall contribute to the fight against climate changes. Thus, the high degree of using renewable energy sources – including the production of bio – fuel and increasing the biomass offer resulting from sustainable agricultural and forestry systems – are aspects encouraged by Axis 1 (modernization of holdings, increasing the added value of agricultural and forestry products) and Axis 3 (setting up and developing micro-enterprises). Although increasing the absorption degree of green houses' gases (especially of CO₂) is encouraged through Axis 2, by: a) first afforestation of

agricultural and non-agricultural lands and b) support for meadows with HNV and meadows important for birds – there are no concrete measures to specify the requirements of adapting to the climate changes, but this aspect remains a possible work theme, benefiting the local communities and under their initiatives through Axis LEADER.

In conformity with The NRDP for the period 2007–2013, measures under Axis 2 are focused upon maintaining and enhancing the quality of the rural environment in Romania, by promoting the sustainable management of both agricultural and forestry land.

This is in recognition of the need to:

- Encourage a better balance between the economic development of rural areas and the sustainable use of the natural resources upon which present and future economic growth will be built and maintained;

- Address the problem of unproductive land in less favoured areas in a manner that mitigates the threat of land abandonment;

- Give financial support for farmers and forest owners for providing environmental services by supporting the conservation and protection of wild flora and fauna, soil and water in accordance with EU environmental objectives relating to agriculture and forestry, including the maintenance of HNV farming systems (High Nature Value), management of Natura 2000 sites, obligations of the Water Framework and Nitrate Directives, and the mitigation of climate changes;

- Maintain and enhance the attractiveness of rural areas as the basis of farm diversification and other alternative economic activities;

- Addressing the challenge of poor levels of farmer awareness of environmental management extensive practices of agricultural lands.

General objective is improving the environment and rural area.

Strategic objectives are:

- Continuing the use of agricultural land in less favoured areas and promoting sustainable farming;

- Preserving and improving the status of natural resources and habitats;

- Promoting the sustainable management of forestry lands.

Specific objectives are:

- To contribute in mountain areas with handicaps to the continued use of agricultural land, thereby maintaining the countryside, as well as maintaining and promoting sustainable farming systems;

- To contribute in other areas with handicaps to the continued use of agricultural land, thereby maintaining the countryside, as well as maintaining and promoting sustainable farming systems;

- To contribute to the sustainable rural development by encouraging agricultural land users to introduce or continue methods of agricultural production compatible with the improvement of the environment, including biodiversity, water, soil and rural landscape;

– To support farmers by compensating for the specific disadvantages resulting from the implementation of the Natura 2000 network on the basis of the obligations incumbent from the directives on the protection of birds, the preservation of natural habitats and wild species;

– Extension of forested areas in order to contribute to the protection of water, soil, against harmful natural and human factors, as well as to ensure leisure activities, based on its multifunction role;

– To support forest owners by compensating for the specific disadvantages resulting from the implementation of the Natura 2000 network on basis of the obligations incumbent from the directives on the protection of birds and the preservation of natural habitats and wild species.

Measures are:

- Support for less favoured mountain areas;
- Payments to farmers in less favoured area, other than mountain areas;
- Agri-environment payments;
- Natura 2000 Payments for agricultural lands;
- First afforestation of agricultural lands;
- First afforestation of non-agricultural lands;
- Natura 2000 Payments for forestry lands.

The choice of such objectives and the financial balance between them is based on the strengths and weaknesses identified based on the analysis of the current situation of environment.

The first priority for the implementation of Axis 2 in the Romanian context is the ***conservation of biodiversity on agricultural and forestry land***.

Large areas of Romania are limited from natural productivity point of view. These areas are usually associated with high biodiversity, but threatened by land abandonment, which can affect both biodiversity and rural area viability, therefore the LFA support will have an important contribution. This contribution will be vital especially in the short term, whilst other measures like agri-environment support and Natura 2000 payments will create a fully functional system for responding to the objective of improving the environment and the countryside.

Romania holds a large variety of valuable habitats and many species of wild animals and plants. A great part of such biodiversity is associated with the sustainable use of agricultural and forestry land. This extensive use includes large areas of valuable semi-natural grasslands found mostly in mountain and hill areas. The majority of these semi-natural grasslands are under an increasing pressure due to the abandonment or intensification of agricultural activities, therefore it is a priority to use appropriate measures to provide the proper support necessary to maintain and improve their natural value by encouraging extensive agricultural practices. Although the concept of *High Natural Value (HNV)* farm land is newly developed in Romania, it is highly relevant and must be promoted since there are many traditional farming systems used by farmers and large areas of extensively

managed agricultural land that support a diversity of wildlife species and habitats. Also, the support for high natural value farming and forestry has the potential to offer the basis for further sustainable development of rural areas including the promotion of traditional food products and diversification through sustainable tourism.

A large proportion of the population of farmland birds breeds in Eastern Europe. In Romania, many species of European concern can still be found in abundant numbers, (e.g. *Crex crex*, *Lanius minor*, *Falco vespertinus*). Although these populations appear to have remained stable during the last 25–30 years, there is a risk that new trends in agricultural intensification and land abandonment will have a negative impact upon them. Romania therefore has a responsibility to promote a proper management through appropriate Axis 2 measures to target the protection of farmland bird species protected at European level, although this will initially only be on a pilot basis until the necessary experience the proper capacities shall be developed for the implementation at a large scale of those birds protection schemes.

To support of farmers and foresters to compensate for the specific disadvantages resulting from the implementation of the Natura 2000 network and the obligations of the Bird and Habitats Directives will also contribute to the conservation of many natural and semi-natural habitats of national and international significance.

The forestry sector development as well as fostering its sustainable management are key elements in order to prevent foods, as well as for soil preserving. The afforestation of agricultural and non-agricultural lands presents a main importance in the achievement those objectives. The land abandonment affects different categories of land utilisation and their afforestation can be an alternative solution for their use. The abandoned land represents, especially, land surfaces from the following categories: arable, pastures and grassland, orchards, vineyards, other permanent cultures, family gardens and that were not used for the last 2 years. The surfaces that are set up as permanent pastures are not the subject of the first afforestation measures, and the agricultural and non-agricultural lands located in the Natura 2000 sites are eligible only if the afforestation projects are in line with the objectives of the sites' management plans.

The second priority for the implementation of Axis 2 in Romania is ***the protection and sustainable management of natural resources, notably water and soil.***

Although, in the present, water resources are generally in a good status, the trends in consumption of chemical inputs in agriculture are showing a real threat. Therefore, there is a range of actions included in Axis 2, which have the potential for reducing this threat (e.g. agri-environment requirements to completely reduce chemical fertilization, organic farming, as well as other practices for preventing nitrate leaching like in case of the green cover crops package) there by contributing to the achievement of the Water Framework Directive objectives. Along with these actions under Axis 2 there are other interventions supported under both Axis 1 and 3 that will add a valuable contributions for water resources protection.

Soil degradation (especially through water erosion) is a major environmental issue in Romania. Although GAEC contains requirements that are contributing to preventing soil erosion on large areas, there is a need to encourage farmers to adopt more efficient practices for soil conservation (e.g. setting up of green crops). Also, afforestation of agricultural and non-agricultural land will have an important impact by preventing soil erosion through water and landslides and also to reduce the risk of floods.

The third priority for the implementation of Axis 2 is *the mitigation of greenhouse gas emissions and climate changes*. Climate changes are a major threat to human society, as well as to the survival of global and local ecosystems therefore, the fight against climate changes represents an important priority for Romania. Under Axis 2, this will be undertaken through the encouragement of afforestation and the expansion of the forest resource onto agricultural and non-agricultural land.

Interventions under other Axis are also contributing at this priority through the development and increased use of renewable energy sources, including bio fuels from agriculture and biomass production from forestry and through improved compliance of livestock farms with standards (e.g. in order to reduce ammonia emissions). The additional funds for Axis 2 received through EERP took into account the priorities resulted from analyses, the allowances being granted in order to preserve and improve the natural resources and habitat status, and especially the high natural value pastures.

5. CONCLUSIONS

The sustainable use of the natural resources raises common problems in all countries, and this responsibility is reflected in several international environment protection agreements.

Sustainable development is a complex, laborious and expensive process, which means the management and preservation of the basic natural resources – land, water, air, plants and animals, through the orientation of the technological and institutional changes so that they could meet the human needs both for the present, and for the next generations.

Due to the bio-geographical conditions, Romania has a diversified and balanced environment, in which vast rural areas are integrated, which generally stand out by a good preservation of the natural soil and water resources, by the variety of the traditional landscapes and a remarkable biological diversity.

In the rural area, agriculture, pisciculture and silviculture are the main occupations for the majority of inhabitants. These occupations are determining factors for the quality of the rural zones and of the natural environment. The efforts of increasing the competitiveness must take into account the need to reduce the

negative effects upon the natural environment and to increase the benefits brought to it.

The improvement of the balance between the economic development of the rural areas and the sustainable use of the natural resources is an important objective of the National Rural Development Program (NPRD).

NRDP participates with several measures to reaching the priority objectives under Axis 2 – biodiversity, water and climate changes:

- the agro-environmental measure presents a special importance mainly for the support to pastures with high natural value, the pastures important for the poultry and for maintaining the traditional pasture management practices;

- the measures on water and soil resources have in view the agro-environment, mainly by supporting the green crops and first afforestation of the agricultural and non-agricultural lands;

- the measures against the climate changes, which focus on the use of renewable energy resources, including the bio-fuel production and growth of biomass supply coming from sustainable agricultural and forestry systems are also encouraged under Axis 1 (modernization of farms, adding value to the agricultural and forestry products) and Axis 3 (creation and development of micro-enterprises).

In order to *improve the environment and the rural area*, the support to agriculture in less favoured area is envisaged, as well as diminution of land abandonment phenomena. A special focus is laid on the support provided to farmers and foresters so as to be able to manage the disadvantages and obligations coming from the implementation of Natura 2000 network.

The projects funded by the two European Funds for Agriculture (EAGF and EARDF) target an adequate management, which should maintain the already existing priorities, namely: preservation of the bio-diversity and agricultural lands with high natural values threatened by abandonment or intensification, ensurance of a good status of the water resources, avoiding further soil degradation and the fight against climate changes and its negative effects by:

- improvement of the efficient use of nitrogen fertilizers, as well as of their storage in view of reducing CH₄ and N₂O emissions and contribution to the decrease of the climate changes;

- stimulation/encouragement for the use of equipment for used water treatment on the farms and in the processing and marketing activities, of the water saving production techniques for the improvement of water management;

- stimulating the perennial energy crops farming and the processing of the agricultural and forestry biomass for renewable energy, having in view to replace the fossil fuels, carbon sequestration, N₂O diminution, contributing to the fight against climate changes;

- stimulating the acquisition of equipment for energy production from other sources than bio-fuel, as well as investments in systems for the production and

supply of renewable energy for the replacement of the traditional fuels, mainly for the ensurance of the necessary energy on the farm;

– development of the forestry sector and the encouragement of its sustainable management (by the afforestation of the agricultural and non-agricultural lands) as key elements for the prevention of flooding and for the soil preservation.

In this context, both agriculture and the forestry resources in Romania can play an important role in the fight against the climate changes, which have been manifest in recent years mainly by floods and high temperatures and prolonged drought.

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